Saskatchewan
Research Council

SASKATOON SRC
CLIMATOLOGICAL REFERENCE STATION
ANNUAL SUMMARY, 1987

by

R.M. Begrand
E.E. Wheaton

SRC Technical Report No. 206

Publication E-906-2-B-88 January, 1988

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ACKNOWLEDGEMENTS

The Saskatchewan Research Council (SRC) gratefully acknowledges the financial support of the Atmospheric Environment Service, Environment Canada, which supports in part the operations of the benchmark station through a contractual agreement.

The observing program owes much to the careful work of R. Begrand, R. Jahren, J. Ross, B. Smith, R. MacPherson, R. Bouvier and J. Matamala.

Discussions with the staff of the Saskatoon Weather Office and K. Leek, Atmospheric Environment Service site inspection officer, have proven most helpful.

Technical drafting for this report was undertaken by Carlos Sardinha.

D. Diduck and L. Kunstmann provided the word processing for this report.

Enquiries concerning the climatological reference station data and its measurement programs are welcome. For further information, please contact:

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ABSTRACT

Data concerning temperature, precipitation, soil temperature, evaporation, windspeed, bright sunshine and solar radiation at the Saskatoon Climatological Reference Station (52°09'N, 106°36'W, 497 m MSL) are presented for the year 1987 and compared with the historic and standard period (1951-80) records.

Monthly mean temperatures were above normal throughout the year, with the exception of July, August and October. In addition to producing an above normal mean annual temperature, 1987 becomes the warmest year on record since 1941. Maximum daily temperature records were surpassed on seven occasions and equalled on six other days during the year.

Monthly precipitation amounts have been consistently below normal with the exception of March and August. This pattern produced considerably below normal annual precipitation and made 1987 the year with the second lowest annual precipitation totals on record since 1941.

Although crops in the Saskatoon area experienced above normal temperatures, proper growth may have been hampered by these temperatures combined with below normal precipitation during the spring months. The summer months provided below normal temperatures and precipitation (with exception of above normal precipitation in August). Autumn temperatures were near normal, while precipitation was below normal, providing a climate suitable for an unhindered harvest.

In summary, 1987 was a warmer and drier year than usual with above normal temperatures and below normal precipitation.

TABLE OF CONTENTS

		Page
ACKNOWLEDGEMENTS		i
ABSTRACT		ii
HISTORY AND STATION LOCATION		1
FOOTNOTES TO CLIMATIC TABLES		3
Table 1.	Annual Climatic Summary, Saskatoon SRC, 1987	7
Table 2.	Monthly Weather Summary, Saskatoon SRC, January 1987	8
Table 3.	Monthly Weather Summary, Saskatoon SRC, February 1987	9
Table 4.	Monthly Weather Summary, Saskatoon SRC, March 1987	10
Table 5.	Monthly Weather Summary, Saskatoon SRC, April 1987	11
Table 6.	Monthly Weather Summary, Saskatoon SRC, May 1987	12
Table 7.	Monthly Weather Summary, Saskatoon SRC, June 1987	13
Table 8.	Monthly Weather Summary, Saskatoon SRC, July 1987	14
Table 9.	Monthly Weather Summary, Saskatoon SRC, August 1987	15
Table 10.	Monthly Weather Summary, Saskatoon SRC, September 1987	16
Table 11.	Monthly Weather Summary, Saskatoon SRC, October 1987	17
Table 12.	Monthly Weather Summary, Saskatoon SRC, November 1987	18
Table 13.	Monthly Weather Summary, Saskatoon SRC, December 1987	19
Table 14.	Soil Temperature and Snow Cover at Saskatoon SRC, January 1987	20
Table 15.	Soil Temperature and Snow Cover at Saskatoon SRC, February 1987	20
Table 16.	Soil Temperature and Snow Cover at Saskatoon SRC, March 1987	21
Table 17.	Soil Temperature and Snow Cover at Saskatoon SRC, April 1987	21
Table 18.	Soil Temperature and Snow Cover at Saskatoon SRC, May 1987	22

TABLE OF CONTENTS (Continued)

		Page
Table 19.	Soil Temperature and Snow Cover at Saskatoon SRC, June 1987	22
Table 20.	Soil Temperature and Snow Cover at Saskatoon SRC, July 1987	23
Table 21.	Soil Temperature and Snow Cover at Saskatoon SRC, August 1987	23
Table 22.	Soil Temperature and Snow Cover at Saskatoon SRC, September 1987	24
Table 23.	Soil Temperature and Snow Cover at Saskatoon SRC, October 1987	24
Table 24.	Soil Temperature and Snow Cover at Saskatoon SRC, November 1987	25
Table 25.	Soil Temperature and Snow Cover at Saskatoon SRC, December 1987	25
Table 26.	Diffuse Solar Radiation (MJ m^{-2}) at Saskatoon SRC, 1987	26
Table 27.	Some Significant Climatic Events, 1987	28
Table 28.	Times of Sunrise at Saskatoon, 1987	29
Table 29.	Times of Sunset at Saskatoon, 1987	30
Figure 1.	Year 1987 Daily Temperature and Cumulative Precipitation	31

HISTORY AND STATION LOCATION

The first meteorological observations appear to have been taken at or near Saskatoon by the Royal Northwest Mounted Police in 1889. At first only temperatures were recorded. There were a number of changes made in the coordinates and as a result there is some disagreement in the early records as to the exact location of the weather observing point. The bulk of the evidence, however, indicates that the location was 52°15'N and 106°20'W, elevation 480 m above sea level. This would place it at Clark's Crossing, on the South Saskatchewan River, approximately 16 km north and east of the centre of the present City of Saskatoon. At that time there was a settlement at Clark's Crossing and also about 10 or 15 families on either side of the river at Saskatoon.

Not too much is known about the early observers. However, the records show that a Major T.H. Keenan took the observations from March, 1892 until March, 1895. Mr. George Will was the observer from January, 1897 until April, 1897. It is thought that Thomas H. Copeland was involved in the observational program from 1895 to May 1, 1901, at which time it was taken over by Mr. Eby, senior. Continuous observations were taken by the Eby's at a site on 8th Street until October 31, 1942, when the station was closed. Mr. Eby continued the program until his death in 1921. His daughter, Miss E.S. Eby, recorded the observations until April, 1931 and was replaced by her brother, J.M. Eby, who continued the program until the station was closed. The Eby station recorded temperature, precipitation and weather notes on fog, thunderstorms, winds and any unusual weather phenomena. Reports were made twice daily, morning and evening.

In 1916 a climatological station was established by the Physics

Department of the University of Saskatchewan and continuous observations were kept twice daily until January 15, 1965. The long time observer at this site was Mr. Sidney Cox. The Saskatchewan Research Council took over the program in the fall of 1963 at our newly established Climatological Reference Station.

The location of the Saskatchewan Research Council's Climatological Reference Station is latitude 52°09'N and longitude 106°36'W and the elevation is 497 m above mean sea level*. The long time observer (16 years) at this present site was Mr. Joe Calvert, who retired from the program in August, 1983. The present regular observers are Ray Begrand, Rolf Jahren, Brett Smith, James Ross, Bob MacPherson, R. Bouvier and J. Matamala.

*From various sources including the Physical Environment of Saskatoon, Canada (E.A. Christiansen ed. 1970) and 1974 Annual Meteorological Summary, Saskatoon, Saskatchewan, Environment Canada, Atmospheric Environment Service.

FOOTNOTES TO CLIMATIC TABLES 1 TO 13

1 The quantities recorded in this column of Table 1 are defined as the element value for the reported year minus the element value for the previous year. The 1987 mean annual temperature was 5.4°C while the 1986 mean annual temperature was 3.2°C, giving a difference of 2.2°C. In 1987 there were 180 days with frost, twenty less than for 1986.

2 In climatology it is often useful to make spatial comparisons of particular element values over a common time period. At an interior continental site such as Saskatoon, a period of 30 years is required to produce statistically stable estimates of the more variable elements. To facilitate spatial comparisons, the World Meteorological Organization currently recommends the standard period January 1, 1951 to December 31, 1980 for data analysis. Items in this column conform to this standard, except where noted. Extreme values in this column are the extremes recorded in the standard period at Saskatoon SRC.

3 Temporal comparisons at a point are also of value in some types of climatic studies. Therefore it is desirable to produce the maximum length of reliable climatic record to carry out studies over a period of time. Data in this column are drawn from the following data sets:

Saskatoon SRC	1964 to 1986
Saskatoon U. of S.	1916 to 1963
Saskatoon	1892 to 1915

Station locations, exposures and measurement procedures were subject to change during this time period. Data presented in this column are unadjusted and users are cautioned accordingly.

4 The mean annual temperature is defined as the average of the daily mean temperatures for one year. In the monthly summaries (Tables 2 to 13) the daily mean temperature reported is the average of the daily mean temperatures for one month under consideration. In turn, the daily mean temperature for a particular day is defined as the arithmetic mean of the daily maximum temperature and the daily minimum temperature for the date. The normal records used for comparison purposes are those published in Volume Two of the Atmospheric Environment Service publication "Canadian Climate Normals, 1951-1980, Temperature".

5 The mean maximum temperature tabulated is the mean of the daily maximum temperatures for one year in the case of Table 1 and for particular months in the cases of Tables 2 to 13. For details concerning measurement procedures, the reader is referred to the Atmospheric Environment Service publication Manual of Climatological Observations, second edition, January, 1978. The normal values are published in Volume Two of the Canadian Climate Normals (note 4).

6 The mean minimum temperature as tabulated is defined as the mean of the daily minimum temperatures averaged over the appropriate time periods. Refer to note 5 above concerning measurement procedures and normals.

7 The word "extreme" refers to the highest or lowest value of a particular element recorded during the period in question. The highest temperature recorded at Saskatoon SRC during 1987 was 38.0°C while the highest value ever recorded at Saskatoon was 40.0°C (see Table 1).

8 A day with frost is recorded on each occasion when the daily minimum temperature is equal to or less than 0°C.

9 A heating degree-day (HDD) is an index of the heating requirement to achieve a stipulated comfort value in an indoor environment. For most purposes, a temperature of less than 18°C is considered uncomfortable and supplementary heating is required. On a specific day, the amount by which 18°C exceeds the daily mean temperature defines the number of heating degree-days for that day. Mathematically:

HDD = (18°C - T), for that day,
where T = daily mean temperature in °C
If T is equal to or greater than 18°C, HDD = 0.

Monthly and annual values of HDD are obtained by summing daily values. The normal used for comparison purposes is the adjusted normal published in the Atmospheric Environment Service publication Volume Four of the "Canadian Climate Normals, 1951-1980, Degree Days". The procedure used to adjust the means for stations with five to nineteen years of data is indicated in this volume. An adjustment is required to make the mean comparable to the thirty year normal.

10 In order for plant growth to proceed, air temperature must exceed a critical value appropriate to the plant species in question. For many members of the grass family, including most commercial cereals grown on the prairies, a base temperature of 5.0°C has been established. On a specified day, the difference between the daily mean temperature and the 5.0°C base temperature defines the number of growing degree-days (GDD). Mathematically:

GDD = (T - 5.0°C), for that day,
where T = daily mean temperature in °C
If T is equal to or less than 5.0°C, GDD = 0.

Daily GDD values are summed to provide totals for the appropriate month, growing season or year. The normal value used for comparison is given in Volume Four of the "Canadian Climate Normals, 1951-1980, Degree Days".

11 Total precipitation is the sum of the daily rainfall and daily snowfall amounts recorded. The snowfall component of precipitation is recorded as an equivalent amount of liquid water. For particulars on precipitation measurement procedures and instruments, the reader is referred to the Atmospheric Environment Service publication Manual of Climatological Observations, second edition, January, 1978. The notation T in this column refers to a trace of precipitation (less than 0.2 mm water equivalent). The normal records used for comparison purposes are those published in Volume Three of the Atmospheric Environment Service publication "Canadian Climate Normals, Precipitation, 1951-1980".

12 Note that prior to 1960, measurement of snowfall was accomplished using snow rulers set vertically in the ground to obtain the thickness of the newly deposited layer. In obtaining precipitation values a standard water equivalent of one inch of snow yielding one-tenth inch of water was assumed. Since these measurements were inaccurate due to snow drifting, compaction and varying water equivalent, the Nipher snow gauge which actually catches snow has been employed at a number of stations (including Saskatoon SRC) in more recent years.

13 A precipitation day is recorded on occasions when the amount of precipitation in a 24-hour period equals or exceeds 0.2 mm water (0.01 inch in English units). If both rain and snow occur on the same day, a snow day, a rain day and a precipitation day are all recorded. If only one form of precipitation occurs on a specified date, a precipitation day, a rain day or a snow day are recorded appropriately. Beginning in 1974, observations at Saskatoon SRC refer to the calendar day. Previous to 1974, the so-called climatological day, beginning at 9 a.m. standard time on the date of reference and ending at 9 a.m. the next morning, was employed in record-keeping. An asterisk (*) appearing in the normal column denotes the occurrence of measurable precipitation on one or more occasions but the 30-year mean when calculated amounts to less than a trace.

14 Evaporation measurements are carried out in the period May 1 to October 31 (weather permitting) only, using the International Hydrological Decade class A pan. The data reported is the sum of the daily net evaporation. Particulars of the measurement procedure are contained in the Atmospheric Environment Service publication "Evaporation", May, 1978. The data base available for comparison is the Saskatoon SRC record for the period 1964 to 1980. The notation M refers to missing data.

15 The mean wind speed value reported is the mean of the hourly wind speeds for the period in question. Average hourly wind speeds are obtained from recording instruments. The anemometer employed is a propeller-type aerofoil at a height of 10 m. Normals used for comparison purposes are those of Saskatoon Airport, from the Atmospheric Environment Service publication "Canadian Normals, Volume 5, Wind 1951-1980".

16 Peak gust refers to the highest instantaneous value recorded by the anemometer system for the period of reference, irrespective of direction and/or duration. Comparison is again with published data for Saskatoon Airport.

17 Total bright sunshine is the sum of the daily bright sunshine values in hours and tenths of hours as recorded by a Campbell-Stokes sunshine recorder. Atmospheric Environment Service publication, "Bright Sunshine, 1951-1980", Volume 7 supplies information on measurement procedures and normals respectively.

18 Percent possible bright sunshine hours refers to the ratio of measured bright sunshine hours to total possible daylight hours in a given period, expressed as a percentage.

19 Total global solar radiation is the sum of the daily values of short wave solar radiation recorded during the period in question. Measurements are carried out on a horizontal surface at the ground and integrated over the whole celestial dome, summing the diffuse and direct components of the solar beam. The measuring instrument is a temperature-compensated Eppley pyranometer. The standard metric unit of measurement is the megajoule per square metre ($MJ\ m^{-2}$). (To facilitate comparison with past years' data: 1.0 $MJ\ m^{-2}$ = 23.895 langleys). Comparison is provided with a provisional normal based on six years of data (1975-1980). Diffuse solar radiation is also recorded (Table 26). The instrument used is an Eppley pyranometer with a shade ring.

20 The year/day entry appearing in Tables 2 to 13 refers to the year and day on which an extreme event occurred. Reference to the month appears in the table heading. For example, referring to Table 2, the warmest day in January, 1987 was the 12th with a high temperature of 5.5°C while the warmest January day on record was January 30, 1931 with a high temperature of 10.0°C.

21 Due to missing observations, faulty instrument calibration, lost records, etc., only partial data are available especially during the period 1892 to 1915. The number of years of useful record is therefore cited.

22 Soil temperature, under a short grass surface with normal snow accumulation, is measured according to procedures outlined in the Atmospheric Environment Service publication "Soil Temperature", January 1, 1976. Depths below surface at which soil temperature measurements are made are: 5 cm, 10 cm, 20 cm, 50 cm, 100 cm, 150 cm and 300 cm. Since soil temperature is affected by profile structure and water content, extrapolation of the measured data is difficult.

Table 1. Annual Climatic Summary, Saskatoon SRC, 1987.

Element	1987 Value	Difference Between 1987 and 1986 Values[1]	Difference Between 1987 and Normal Values[2]	Difference Between 1987 Value and Value From All Years[3]
Mean Annual Temperature[4] (°C)	5.4	2.2	3.6	
Mean Maximum Temperature[5] (°C)	11.5	2.5	4.0	
Mean Minimum Temperature[6] (°C)	-0.8	1.8	3.2	
Extreme Maximum Temperature[7] (°C)	38.0 (June)	4.5	1.3	-2.0
Extreme Minimum Temperature[7] (°C)	-25.0 (Feb., Dec.)	13.5	19.4	25.0
Days with Frost[8]	180	-20	-19	
Heating Degree-Days[9] (18°C base)	4712	-722	-1317	
Growing Degree-Days[10] (5°C base)	1904	315	268	
Total Precipitation[11] (mm)	232.4	-179.7	-138.1	
Total Rainfall[11] (mm)	165.1	-164.8	-77.9	
Total Snowfall[12] (cm)	67.3	-14.9	-50.7	
Greatest 24-hr Precipitation (mm)	12.0 (May)	-11.5	-33.5	-87.4
Greatest 24-hr Rainfall (mm)	12.0 (May)	-11.5	-33.5	-87.4
Greatest 24-hr Snowfall (cm)	8.4 (Mar.)	-3.1	-23.6	-28.3
Precipitation Days[13]	99	2	-17.0	
Rainfall Days[13]	65	-2	6	
Snowfall Days[13]	39	9	-23	
Total Evaporation[14] (mm)	1077 (May-Oct.)	73.0	359	
Mean Wind Speed[15] (km/hr)	13.5	0.3	-4.0	
Peak Wind Gust[16] (km/hr)	88 (June-July)	-21.0	-63	
Total Bright Sunshine[17] (hr)	2020.9	-43.0	-428.8	
Total Global Radiation[19] (MJ m^{-2})	3984.8	-266.0	-494.3	
Total Diffuse Radiation[19] (MJ m^{-2})	1584.3	-81.6	--	

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
JANUARY, 1987

Table 2.

Element	1987 Value	1986 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	-9.3	-8.6	-19.1	
Monthly Mean Maximum Temperature[5] (°C)	-3.8	-3.6	-14.2	
Monthly Mean Minimum Temperature[6] (°C)	-14.7	-13.5	-23.9	
Extreme Maximum Temperature[7] (°C)	5.5	7.0	6.1	10.0
Year/Day(s)[20]	1987/12	1986/11	1968/23 & 1973/15	1931/30
Years of Record[21]	1	1	17	89
Extreme Minimum Temperature[7] (°C)	-23.5	-25.5	-43.9	-48.9
Year/Day(s)[20]	1987/14 & 15	1986/6	1966/22 & 1969/29	1893/31
Years of Record[21]	1	1	17	89
Days with Frost[8]	31	31	31	
Heating Degree-Days[9] (18°C base)	849.0	826.5	1149.0	
Growing Degree-Days[10] (5°C base)	0.0	0.0	0.0	
Total Precipitation[11] (mm)	11.2	31.8	22.6	
Total Rainfall[11] (mm)	0.2[e]	0.0	0.1	
Total Snowfall[12] (cm)	11.0	31.8	21.2	
Greatest 24-hour Precipitation (mm)	4.4	9.2	12.4	30.5
Year/Day(s)[20]	1987/17	1986/17	1969/11	1893/23
Years of Record[21]	1	1	17	89
Greatest 24-hour Rainfall (mm)	0.2	0.0	1.8	2.0
Year/Day(s)[20]	1987/13	--	1976/27	1947/10
Years of Record[21]	1	1	17	89
Greatest 24-hour Snowfall (cm)	4.4	9.2	12.4	30.5
Year/Day(s)[20]	1987/17	1986/17	1969/11	1893/23
Years of Record[21]	1	1	17	89
Precipitation Days[13]	6	6	13	
Rainfall Days[13]	1	0	*	
Snowfall Days[13]	6	6	13	
Total Evaporation[14] (mm)	--	--	May-Sept.	
Mean Wind Speed[15] (km/hr)	14.1	13.7	16.8	
Peak Gust Speed[16] (km/hr)	72.0	109.0	97.0	
Total Bright Sunshine[17] (hr)	102.2	84.5	103.0	
Percent Possible Bright Sunshine[18]	40	33	40	
Total Global Radiation[19] (MJ m^{-2})	127.6	114.1	132.6	
Total Diffuse Radiation[19] (MJ m^{-2})	60.9	66.3	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	-5.1, -2.0	-4.9, -2.8	-8.7, -3.8	
Mean Soil Temperature[22] (°C) (150, 300 cm)	2.2, 4.8	0.7, 3.4	2.1, 4.5	

SUMMARY:

e - indicates estimate

January, 1987 becomes the third warmest since 1893 with a mean temperature of -9.3°C. With the exception of the 14th, above normal temperatures were recorded for the entire month! Also, extreme maximum daily records were equalled or exceeded on the 4th and 12th respectively when day time highs reached 4° and 6°C. The mean temperature for Saskatoon SRC (-9.3°C) was above the normal (-19.1°C) by 9.8°C. The total precipitation (11.2 mm) recorded at the Climate Reference Station was slightly less than one half of the normal (22.6 mm) amount. Precipitation consisted of 0.2 mm of rain and 11.0 mm of snow (water equivalent). Above normal temperatures have resulted in 26% fewer heating degree days than normal. Total bright sunshine hours (102.2 hrs) recorded were near normal (103.0 hrs). Soil temperatures at all seven depths were above the 1951-1980 normals with differences ranging from 0.1° to 4.5°. Above normal temperatures recorded during January with below normal precipitation has made January, 1987 a mild and dry month.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
FEBRUARY, 1987

Table 3.

Element	1987 Value	1986 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	-8.3	-15.8	-14.5	
Monthly Mean Maximum Temperature[5] (°C)	-3.8	-10.9	-9.3	
Monthly Mean Minimum Temperature[6] (°C)	-12.7	-20.7	-19.7	
Extreme Maximum Temperature[7] (°C)	4.5	6.5	6.1	12.8
Year/Day(s)[20]	1987/7	1986/25	1968/29	1931/19
Years of Record[21]	1	1	17	91
Extreme Minimum Temperature[7] (°C)	-25.0	-38.5	-41.1	-50.0
Year/Day(s)[20]	1987/26	1986/20	1972/6	1893/1
Years of Record[21]	1	1	17	91
Days with Frost[8]	28	28	28	
Heating Degree-Days[9] (18°C base)	736.0	949.5	920.4	
Growing Degree-Days[10] (5°C base)	0.0	0.0	0.0	
Total Precipitation[11] (mm)	16.6	11.6	21.9	
Total Rainfall[11] (mm)	0.0	0.0	0.4	
Total Snowfall[12] (cm)	16.6	11.6	18.5	
Greatest 24-hour Precipitation (mm)	6.2	8.6	14.2	20.3
Year/Day(s)[20]	1987/14	1986/16	1979/13	1918/7
Years of Record[21]	1	1	17	90
Greatest 24-hour Rainfall (mm)	0.0	0.0	1.8	8.1
Year/Day(s)[20]	--	--	1968/26	1953/3
Years of Record[21]	1	1	17	91
Greatest 24-hour Snowfall (cm)	6.2	8.6	14.2	20.1
Year/Day(s)[20]	1987/14	1986/16	1979/13	1918/7
Years of Record[21]	1	1	17	90
Precipitation Days[13]	8	6	11	
Rainfall Days[13]	0	0	*	
Snowfall Days[13]	8	6	10	
Total Evaporation[14] (mm)	--	--	--	
Mean Wind Speed[15] (km/hr)	12.2	9.5	16.4	
Peak Gust Speed[16] (km/hr)	60.0	59.0	85.0	
Total Bright Sunshine[17] (hr)	117.4	125.0	135.1	
Percent Possible Bright Sunshine[18]	42.8	45.6	49.0	
Total Global Radiation[19] (MJ m^{-2})	199.1	222.9	212.9	
Total Diffuse Radiation[19] (MJ m^{-2})	92.1	111.0	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	-4.1, -1.5	-7.8, -4.3	-7.3, -4.1	
Mean Soil Temperature[22] (°C) (150, 300 cm)	1.3, 3.7	0.4, 2.7	1.0, 3.2	

SUMMARY:

The monthly mean temperature was 6.2°C above the normal temperature; in fact, the mean temperature was slightly above the March normal temperature (-8.5°C). Above normal temperatures were recorded on 25 of 28 days, 23 of which were consecutive. Below normal temperatures recorded on the 24th to 26th marked the end of the longest warm spell to date (40 days, January 15-February 23). February, 1987 becomes the eighth warmest on record since 1901. The total precipitation (16.6 mm) recorded was slightly below the 1951-1980 normal (21.9 mm). Total precipitation measured by the nipher gauge fell as snow with approximately 85% of the total falling between February 13 to 16. The January-February total precipitation (27.8 mm) was 16.7 mm below the normal for the same period. The October, 1986 to February, 1987 total precipitation (52.8 mm) was approximately one half of the normal (103.8 mm) recorded. Approximately 13% fewer than normal sunshine hours were recorded (117.4 hrs). Above normal temperatures resulted in 20% fewer than normal heating degree days. As of the last day of February, soil temperatures at all seven depths were above normal (0.3° to 4.3°), and soil was frozen to at least the 100 cm depth.

February has been a mild and dry month with above normal temperatures and precipitation. The 1986-1987 winter has been drier than normal with only one half of the normal accumulated precipitation having been recorded.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
MARCH, 1987

Table 4.

Element	1987 Value	1986 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	-3.9	-1.0	-8.5	
Monthly Mean Maximum Temperature[5] (°C)	0.6	4.0	-3.5	
Monthly Mean Minimum Temperature[6] (°C)	-8.4	-5.9	-13.6	
Extreme Maximum Temperature[7] (°C)	13.0	17.0	15.0	22.8
Year/Day(s)[20]	1987/6	1986/27	1973/24	1910/23
Years of Record[21]	1	1	17	91
Extreme Minimum Temperature[7] (°C)	-23.5	-20.0	-38.9	-43.3
Year/Day(s)[20]	1987/7	1986/9	1972/2	1897/14
Years of Record[21]	1	1	17	91
Days with Frost[8]	29	27	31	
Heating Degree-Days[9] (18°C base)	691.5	587.0	826.0	
Growing Degree-Days[10] (5°C base)	1.5	12.5	0.9	
Total Precipitation[11] (mm)	26.3	20.3	22.3	
Total Rainfall[11] (mm)	0.8	2.1	1.1	
Total Snowfall[12] (cm)	25.5	18.2	19.5	
Greatest 24-hour Precipitation (mm)	8.4	11.5	32.0	32.0
Year/Day(s)[20]	1987/14	1986/24	1967/30	1967/30
Years of Record[21]	1	1	17	86
Greatest 24-hour Rainfall (mm)	0.4	1.3	5.6	7.4
Year/Day(s)[20]	1987/21, 22	1986/28	1968/3	1938/28
Years of Record[21]	1	1	17	91
Greatest 24-hour Snowfall (cm)	8.4	11.5	32.0	32.0
Year/Day(s)[20]	1987/14	1986/24	1967/30	1967/30
Years of Record[21]	1	1	17	86
Precipitation Days[13]	10	7	10	
Rainfall Days[13]	2	2	1	
Snowfall Days[13]	10	5	10	
Total Evaporation[14] (mm)	--	--	(May-Sept.)	
Mean Wind Speed[15] (km/hr)	14.5	13.2	17.5	
Peak Gust Speed[16] (km/hr)	70.0	77.0	93.0	
Total Bright Sunshine[17] (hr)	113.9	126.3	190.0	
Percent Possible Bright Sunshine[18]	31	35	52	
Total Global Radiation[19] (MJ m^{-2})	307.1	299.4	422.9	
Total Diffuse Radiation[19] (MJ m^{-2})	191.5	177.9	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	-2.0, -0.5	-0.1, -0.5	-3.5, -2.1	
Mean Soil Temperature[22] (°C) (150, 300 cm)	1.0, 2.9	0.1, 2.2	0.5, 2.5	

SUMMARY:

The mean temperature (-3.9°C) was 4.6°C above the 1951-1980 normal (-8.5°C). Normal and above normal temperatures were recorded on 24 of 31 days, while below normal temperatures were recorded on seven days. Daily maxima ranged from -12.5°C to 13.0°C while minima ranged from -23.5°C to 0.5°C. Daily maximum temperature records (1892-1986) for the 5th and 6th were broken when daytime highs reached 10°C and 13°C respectively; following those temperatures, the extreme minimum (-23.5°C) was recorded on the 7th. Total precipitation (26.3 mm) recorded by CRS was above the normal (by 4.0 mm). Precipitation consisted of 25.5 mm of snow (water equivalent) and 0.8 mm of rain. The January-March total precipitation (54.1 mm) was 12.7 mm below the normal for the same period. The October, 1986 to March, 1987 precipitation (79.1 mm) was approximately 63 of the normal (126.1 mm). Forty percent fewer than normal sunshine hours were recorded (113.9 hours). Soil temperatures at all depths were above normal (by 0.4° to 2.8°).

With the exception of seven days with below normal temperatures, March has generally been a warm month with above normal temperature and precipitation.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
APRIL, 1987

Table 5.

Element	1987 Value	1986 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	8.5	3.3	3.4	
Monthly Mean Maximum Temperature[5] (°C)	15.8	9.7	9.0	
Monthly Mean Minimum Temperature[6] (°C)	1.1	-3.2	-2.3	
Extreme Maximum Temperature[7] (°C)	27.5	21.5	30.6	33.0
Year/Day(s)[20]	1987/27	1986/9	1977/26	1952/28
Years of Record[21]	1	1	17	90
Extreme Minimum Temperature[7] (°C)	-7.5	-14.0	-27.8	-28.3
Year/Day(s)[20]	1987/10	1986/12	1979/1	1893/1954
Years of Record[21]	1	1	17	90
Days with Frost[8]	11	25	22	
Heating Degree-Days[9] (18°C base)	280.0	439.0	440.0	
Growing Degree-Days[10] (5°C base)	128.5	36.5	47.0	
Total Precipitation[11] (mm)	13.7	6.2	21.4	
Total Rainfall[11] (mm)	12.1	5.4	10.7	
Total Snowfall[12] (cm)	1.6	0.8	10.0	
Greatest 24-hour Precipitation (mm)	4.5	1.8	19.3	30.2
Year/Day(s)[20]	1987/18	1986/16 & 17	1968/20	1955/19
Years of Record[21]	1	1	17	90
Greatest 24-hour Rainfall (mm)	4.5	1.8	11.7	26.7
Year/Day(s)[20]	1987/18	1986/16 & 17	1964/25	1926/21
Years of Record[21]	1	1	17	90
Greatest 24-hour Snowfall (cm)	1.6	0.8	18.0	20.3
Year/Day(s)[20]	1987/9	1986/2	1968/20	1942/5
Years of Record[21]	1	1	17	90
Precipitation Days[13]	6	6	7	
Rainfall Days[13]	6	5	5	
Snowfall Days[13]	1	1	4	
Total Evaporation[14] (mm)	--	--	(May-Sept.)	
Mean Wind Speed[15] (km/hr)	16.0	14.9	19.0	
Peak Gust Speed[16] (km/hr)	60	70	108	
Total Bright Sunshine[17] (hr)	230.1	200	232	
Percent Possible Bright Sunshine[18]	55	48	56	
Total Global Radiation[19] (MJ m^{-2})	428	466	519	
Total Diffuse Radiation[19] (MJ m^{-2})	137	203	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	3.8, 5.0	4.6, 2.6	4.0, 2.0	
Mean Soil Temperature[22] (°C) (150, 300 cm)	1.9, 2.6	0.9, 2.0	0.9, 2.1	

SUMMARY:

The April mean daily temperature (8.5°C) was above the 1951-1980 normal (3.4°C) by 5.1°C. Above normal mean temperatures were recorded on 26 of 30 days while below normal mean temperatures were recorded on four days. Daily maxima ranged from 27.5°C to -2.5°C while daily minima ranged from 7.5°C to -5.5°C. Daily maximum temperature records were surpassed on the 3rd and 5th when temperatures of 19.5°C were recorded on both days, and equalled on the 6th and 27th when temperatures of 21°C and 27°C were recorded at CRS. Total precipitation (13.7 mm) recorded at CRS was 36% below the normal (21.4 mm). Precipitation consisted of 12.1 mm of rain and 1.6 mm (water equivalent) of snow. The January-April precipitation (67.8 mm) remains below the normal (88.2 mm) by 20.4 mm. Bright sunshine hours (230.1) recorded at CRS were very near normal (232.0). Soil temperatures at all levels were above normal (by 0.5°C to 2.0°C). Above normal temperatures are reflected in 36 fewer than normal heating degree days, and 27% greater than normal growing degree days.

With above normal temperatures recorded for most of the month, April 1987 becomes the fourth warmest on record since 1901. Generally, April has been a warm and dry month with above normal temperatures and below normal precipitation.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
MAY, 1987

Table 6.

Element	1987 Value	1986 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	14.1	12.7	11.2	
Monthly Mean Maximum Temperature[5] (°C)	21.6	19.4	18.1	
Monthly Mean Minimum Temperature[6] (°C)	6.5	6.0	4.3	
Extreme Maximum Temperature[7] (°C)	31.0	33.5	34.0	37.2
Year/Day(s)[20]	1587/12	1986/29	1980/21	1936/27
Years of Record[21]	1	1	17	90
Extreme Minimum Temperature[7] (°C)	-5.0	-4.0	-10.0	-12.8
Year/Day(s)[20]	1987/21	1986/1	1967/2	1907/6
Years of Record[21]	1	1	17	90
Days with Frost[8]	2	7	6	
Heating Degree-Days[9] (18°C base)	119.5	190.5	216.0	
Growing Degree-Days[10] (5°C base)	285.0	246.0	199.0	
Total Precipitation[11] (mm)	33.6	56.0	39.6	
Total Rainfall[11] (mm)	33.6	56.0	37.7	
Total Snowfall[12] (cm)	0.0	T	1.8	
Greatest 24-hour Precipitation (mm)	12.0	18.4	33.8	51.3
Year/Day(s)[20]	1987/28	1986/9	1975/19	1909/30
Years of Record[21]	1	1	17	90
Greatest 24-hour Rainfall (mm)	12.0	18.4	33.8	51.3
Year/Day(s)[20]	1987/28	1986/9	1975/19	1909/30
Years of Record[21]	1	1	17	90
Greatest 24-hour Snowfall (cm)	0	T	4.3	26.2
Year/Day(s)[20]	--	1986/9,14,15	1969/14	1983/10
Years of Record[21]	1	1	17	90
Precipitation Days[13]	9	9	7	
Rainfall Days[13]	9	9	1	
Snowfall Days[13]	0	0	7	
Total Evaporation[14] (mm)	229	222	208.7	
Mean Wind Speed[15] (km/hr)	15.4	17.7	19.4	
Peak Gust Speed[16] (km/hr)	69	57	132	
Total Bright Sunshine[17] (hr)	252	243	292	
Percent Possible Bright Sunshine[18]	50	50	60	
Total Global Radiation[19] (MJ m^{-2})	584	580	659	
Total Diffuse Radiation[19] (MJ m^{-2})	210	199	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	13.2, 10.3	11.9, 8.5	12.3, 8.8	
Mean Soil Temperature[22] (°C) (150, 300 cm)	5.6, 3.8	4.2, 3.0	4.1, 2.9	

SUMMARY:

The May mean daily temperature (14.1°C) was above the normal (11.2°C) by 2.9°C. Daily maxima ranged from 31.0°C to 11.0°C, while daily minima ranged from 13.0°C to -5.0°C. Above normal temperatures (recorded between the 1st to 15th) were followed by a cool spell (16th to 22nd), and then temperatures returned to above normal (on the 23rd to 31st). Total precipitation (33.6 mm) was slightly below the normal (39.6 mm). The January to May total precipitation (101.4 mm) was 79% of the normal for the same period. The net evaporation (229 mm) from the Class A pan slightly surpassed the normal (209 mm). The mean wind speed (15.4 km/hr) was slightly below the 1951-1980 normal (19.4 km/hr). Soil temperatures at all levels remain above normal (by 0.9°C to 2.0°C). Ten percent fewer than normal (292 hrs) sunshine hours were recorded (252 hrs). Above normal temperatures for major portions of this month have resulted in 43% greater than normal growing degree days and 45% fewer than normal heating degree days.

Above normal mean temperatures recorded on 23 of 31 days makes May, 1987 the fifth warmest on record since 1901. Below normal precipitation and above normal temperatures have made May a dry and warm month.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
JUNE, 1987

Table 7.

Element	1987 Value	1986 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	18.9	15.7	15.6	
Monthly Mean Maximum Temperature[5] (°C)	26.0	22.9	22.1	
Monthly Mean Minimum Temperature[6] (°C)	11.7	8.4	9.1	
Extreme Maximum Temperature[7] (°C)	38.0	31.5	35.6	40.0
Year/Day(s)[20]	1987/15	1986/17	1976/4	1900/21 & 1941/24
Years of Record[21]	1	1	17	91
Extreme Minimum Temperature[7] (°C)	5.5	3.5	-3.3	-3.9
Year/Day(s)[20]	1987/4	1986/14 & 16	1967/6	1903/9 & 1917/2
Years of Record[21]	1	1	17	91
Days with Frost[8]	0	0	0	
Heating Degree-Days[9] (18°C base)	25.5	83.5	89.0	
Growing Degree-Days[10] (5°C base)	419.5	320.0	319.0	
Total Precipitation[11] (mm)	22.0	52.7	59.9	
Total Rainfall[11] (mm)	22.0	52.7	59.9	
Total Snowfall[12] (cm)	0	0	0	
Greatest 24-hour Precipitation (mm)	8.0	17.4	45.0	99.4
Year/Day(s)[20]	1987/20	1986/18	1970/10	1983/24
Years of Record[21]	1	1	17	91
Greatest 24-hour Rainfall (mm)	8.0	17.4	45.0	99.4
Year/Day(s)[20]	1987/20	1986/18	1970/10	1983/24
Years of Record[21]	1	1	17	91
Greatest 24-hour Snowfall (cm)	-	-	0	1.8
Year/Day(s)[20]	-	-	-	1938/29
Years of Record[21]	-	-	17	91
Precipitation Days[13]	11	12	11	
Rainfall Days[13]	11	12	11	
Snowfall Days[13]	0	0	0	
Total Evaporation[14] (mm)	265.5	239.1	218.3	
Mean Wind Speed[15] (km/hr)	16.0	13.8	18.2	
Peak Gust Speed[16] (km/hr)	88	90	101	
Total Bright Sunshine[17] (hr)	255.5	287.2	294.0	
Percent Possible Bright Sunshine[18]	51	58	59	
Total Global Radiation[19] (MJ m^{-2})	614	652	683	
Total Diffuse Radiation[19] (MJ m^{-2})	227	216	-	
Mean Soil Temperature[22] (°C) (10, 50 cm)	18.6, 14.7	17.8, 14.7	17.5, 14.0	
Mean Soil Temperature[22] (°C) (150, 300 cm)	8.8, 5.7	8.4, 5.1	8.3, 5.2	

SUMMARY:

The June mean daily temperature (18.9°C) was 3.3°C above the normal (15.6°C). Daily maxima ranged between 16.5°C and 38.0°C, while daily minima ranged between 5.5°C and 18.5°C. Above normal daily mean temperatures were recorded on 24 of 30 days while below normal temperatures occurred sporadically on six days. The record extreme maximum temperatures for the 15th (38.0°C) was equalled on the 15th. Total precipitation (22.0 mm) recorded at CRS was substantially below the 1951-80 normal (59.9 mm) by 37.9 mm. The January-June total precipitation (123.4 mm) was only 66% of the normal (187.7 mm). Evaporation from the Class A pan surpassed the normal (218.3 mm) by 47.2 mm. Soil temperatures at all depths were above normal (by 0.2° to 2.2°C). Above normal temperatures this month have resulted in above normal growing degree days and below normal heating degree days.

Above normal temperatures recorded this month make June 1987 the second warmest on record since 1901, while below normal precipitation has made it a very dry month.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
JULY, 1987

Table 8.

Element	1987 Value	1986 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	18.3	17.1	18.4	
Monthly Mean Maximum Temperature[5] (°C)	24.7	23.2	25.2	
Monthly Mean Minimum Temperature[6] (°C)	11.9	10.9	11.6	
Extreme Maximum Temperature[7] (°C)	33.5	33.0	36.7	40.0
Year/Day(s)[20]	1987/27	1986/2	1964/12	1919/17;1941/19
Years of Record[21]	1	1	17	91
Extreme Minimum Temperature[7] (°C)	5.0	4.5	1.7	-0.6
Year/Day(s)[20]	1987/11	1986/7	1967/2	1918/25
Years of Record[21]	1	1	17	91
Days with Frost[8]	0	0	0	
Heating Degree-Days[9] (18°C base)	40.0	36.0	32.8	
Growing Degree-Days[10] (5°C base)	416.5	378.5	416.3	
Total Precipitation[11] (mm)	26.3	115.8	56.2	
Total Rainfall[11] (mm)	26.3	115.8	56.2	
Total Snowfall[12] (cm)	0.0	0.0	0.0	
Greatest 24-hour Precipitation (mm)	7.4	17.2	45.5	79.2
Year/Day(s)[20]	1987/18	1986/12	1968/29	1946/3
Years of Record[21]	1	1	17	91
Greatest 24-hour Rainfall (mm)	7.4	17.2	45.5	79.2
Year/Day(s)[20]	1987/18	1986/12	1968/29	1946/3
Years of Record[21]	1	1	17	91
Greatest 24-hour Snowfall (cm)	0.0	0.0	0.0	0.0
Year/Day(s)[20]	--	--	--	--
Years of Record[21]	1	1	17	--
Precipitation Days[13]	13	18	11	
Rainfall Days[13]	13	18	11	
Snowfall Days[13]	0	0	0	
Total Evaporation[14] (mm)	210.8	200.3	230.1	
Mean Wind Speed[15] (km/hr)	11.7	13.2	16.7	
Peak Gust Speed[16] (km/hr)	88	72	105	
Total Bright Sunshine[17] (hr)	217.1	264.5	341.0	
Percent Possible Bright Sunshine[18]	43	53	68	
Total Global Radiation[19] (MJ m^{-2})	426*	607	737	
Total Diffuse Radiation[19] (MJ m^{-2})	162*	226*	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	19.2, 16.2	18.8, 16.5	19.7, 16.9	
Mean Soil Temperature[22] (°C) (150, 300 cm)	10.8, 7.6	10.7, 7.1	11.4, 7.6	

*5 days missing data due to equipment repair
2 days missing data due to power outage.

SUMMARY:

The mean temperature (18.3°C) was very near normal (18.4°C). Below normal temperatures were recorded on 18 of 31 days, while normal or above normal temperatures were recorded on 13 days. Temperatures through the month ranged from a maximum of 33.5°C (on the 27th) to a minimum of 5.0°C (on the 11th). The monthly precipitation (26.3 mm) was 29.9 mm below the 1951-80 normal (56.2 mm). The January-July total precipitation of 149.7 mm was 94.7 mm below normal for the same time period. While the total number of growing degree days (416.5) was very near normal, the number of heating degree days (40.0) was above normal. Mean soil temperatures were above normal at the 5 and 20 cm levels (by 0.8 to 0.9°C) while temperatures at the 10 cm and 50-300 cm levels were all above normal. Total bright sunshine hours (217.1 hrs.) as measured by the Campbell Stokes recorder was well below the normal (341.0 hrs) by 123.9 hrs.

July was a warm and dry month with near normal temperatures and below normal precipitation.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
AUGUST, 1987

Table 9.

Element	1987 Value	1986 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	14.8	17.1	17.2	
Monthly Mean Maximum Temperature[5] (°C)	21.2	24.6	24.2	
Monthly Mean Minimum Temperature[6] (°C)	8.3	9.6	10.2	
Extreme Maximum Temperature[7] (°C)	29.5	33.5	36.7	37.8
Year/Day(s)[20]	1987/7th & 28th	1986/29	1970/7	1893/6, 1949/6
Years of Record[21]	1	1	17	90
Extreme Minimum Temperature[7] (°C)	3.0	1.0	-2.8	-2.8
Year/Day(s)[20]	1987/22nd & 30th	1986/26	1976/28	1976/28
Years of Record[21]	1	1	17	90
Days with Frost[8]	0	0	0	
Heating Degree-Days[9] (18°C base)	105.5	61.0	60.1	
Growing Degree-Days[10] (5°C base)	305.5	378.0	378.7	
Total Precipitation[11] (mm)	44.3	27.7	35.1	
Total Rainfall[11] (mm)	44.3	27.7	35.1	
Total Snowfall[12] (cm)	0.0	0.0	0.0	
Greatest 24-hour Precipitation (mm)	11.6	23.5	24.6	73.7
Year/Day(s)[20]	1987/14	1986/5	1968/18	1945/3
Years of Record[21]	1	1	17	90
Greatest 24-hour Rainfall (mm)	11.6	23.5	24.6	73.7
Year/Day(s)[20]	1987/14	1986/5	1968/18	1945/3
Years of Record[21]	1	1	17	90
Greatest 24-hour Snowfall (cm)	0.0	0.0	0.0	0.0
Year/Day(s)[20]	-	-	-	-
Years of Record[21]	1	1	17	
Precipitation Days[13]	11	5	10	
Rainfall Days[13]	11	5	10	
Snowfall Days[13]	0	0	0	
Total Evaporation[14] (mm)	157.2	251.0	201.4	
Mean Wind Speed[15] (km/hr)	10.6	10.2	16.5	
Peak Gust Speed[16] (km/hr)	58	60	151	
Total Bright Sunshine[17] (hr)	200.8	295.3[e]	293.0	
Percent Possible Bright Sunshine[18]	44	65	65	
Total Global Radiation[19] (MJ m^{-2})	481.7	578.1	605.0	
Total Diffuse Radiation[19] (MJ m^{-2})	191.2	158.6	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	16.2, 15.8	18.2, 16.8	18.4, 16.7	
Mean Soil Temperature[22] (°C) (150, 300 cm)	11.8, 9.0	12.0, 8.7	12.6, 9.3	

SUMMARY

The August mean temperature (14.8°C) was 2.4° below the normal. Below normal temperatures were recorded on 26 of 31 days, while only 4 days with above normal temperatures were recorded sporadically through the month. Extreme maxima ranged between 29.5°C (on the 7th and 28th) to 13.0°C (on the 11th). Extreme minima ranged between 13.5°C (on the 1st and 5th) to 3.0°C (on the 22nd and 30th). Total precipitation (44.3 mm) surpassed the normal (35.1 mm) by 26% making it only the second month this year with above normal precipitation. The January-August total precipitation (194.0 mm) remains 85mm below the 1951-80 normal for the same period. Seventy-six percent greater than normal heating degree days were recorded, while 19% fewer than normal growing degree days were recorded. Both bright sunshine hours (200.8 hrs) and mean wind speed (10.6 km/hr) were substantially below normal. Soil temperatures at all depths were below normal (by 0.3 to 2.2°C).

August has been a cool and wet month with below normal temperatures, and above normal precipitation.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
SEPTEMBER, 1987

Table 10.

Element	1987 Value	1986 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	14.4	9.2	11.5	
Monthly Mean Maximum Temperature[5] (°C)	22.2	14.1	17.8	
Monthly Mean Minimum Temperature[6] (°C)	6.5	4.3	5.1	
Extreme Maximum Temperature[7] (°C)	35.0	21.0	35.6	35.6
Year/Day(s)[20]	1987/2	1986/2	1978/4	1978/4
Years of Record[21]	1	1	16	88
Extreme Minimum Temperature[7] (°C)	0.5	-2.0	-7.8	-11.1
Year/Day(s)[20]	1987/18	1986/8	1978/30	1908/28
Years of Record[21]	1	1	16	88
Days with Frost[8]	0	5	4	
Heating Degree-Days[9] (18°C base)	121.0	260.5	201.3	
Growing Degree-Days[10] (5°C base)	284.5	132.0	200.8	
Total Precipitation[11] (mm)	14.5	65.0	32.2	
Total Rainfall[11] (mm)	14.5	65.0	30.8	
Total Snowfall[12] (cm)	0.0	0.0	1.3	
Greatest 24-hour Precipitation (mm)	7.0	21.8	29.6	44.2
Year/Day(s)[20]	1987/3	1986/20	1980/3	1931/12
Years of Record[21]	1	1	16	88
Greatest 24-hour Rainfall (mm)	7.0	21.8	29.6	44.2
Year/Day(s)[20]	1987/3	1986/20	1980/3	1931/12
Years of Record[21]	1	1	16	88
Greatest 24-hour Snowfall (cm)	0.0	0.0	5.6	17.6
Year/Day(s)[20]	--	--	1973/14	1982/28
Years of Record[21]	1	--	16	88
Precipitation Days[13]	5	11	9	
Rainfall Days[13]	5	11	9	
Snowfall Days[13]	0	0	1	
Total Evaporation[14] (mm)	156.2	91.6	124.1	
Mean Wind Speed[15] (km/hr)	11.8	13.4	18.1	
Peak Gust Speed[16] (km/hr)	63.0	89.0	148.0	
Total Bright Sunshine[17] (hr)	197.4	114.6	191.0	
Percent Possible Bright Sunshine[18]	52	30	50	
Total Global Radiation[19] (MJ m^{-2})	386.7	285.5	409.3	
Total Diffuse Radiation[19] (MJ m^{-2})	114.8	124.2	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	13.7, 14.1	11.2, 13.0	12.3, 13.2	
Mean Soil Temperature[22] (°C) (150, 300 cm)	11.4, 9.5	11.7, 9.7	12.1, 10.1	

SUMMARY:

The September mean temperature (14.4°C) was 2.9°C above the normal (11.5°C). Above normal temperatures were recorded for most of the month with the exception of a cool spell between the 7th to the 11th. Although the extreme maximum (35.0°C) recorded on the 2nd came very close to breaking the record for the month (35.6°C in 1978), it did surpass the previous record (34°C) for that day. Extreme minima ranged between 14.0°C (on the 2nd) and 0.5°C (on the 18th). Extreme maxima ranged between 35.0°C (on the 2nd) and 13.0°C (on the 9th). Total precipitation (14.5 mm) was below the normal (32.2 mm) by 17.7 mm. The January to September total precipitation (208.5 mm) remains below the normal (311.2 mm) by 102.7 mm for the same period. Total bright sunshine hours (197.4 hours) was 3% above the normal (191.0 hours). Soil temperatures at the 5 to 100 cm levels remain above the normal temperatures (by 0.1°C to 4.3°C), while temperatures at the 150 to 300 cm levels were slightly below the normal (by 0.2°C to 0.3°C). September remained frost free as there were no days with frost recorded at the Climate Reference Station.

September has been an extremely warm and dry month with above normal temperatures and below normal precipitation.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
OCTOBER, 1987

Table 11.

Element	1987 Value	1986 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	5.0	5.9	5.2	
Monthly Mean Maximum Temperature[5] (°C)	11.5	12.5	11.1	
Monthly Mean Minimum Temperature[6] (°C)	-1.6	-0.8	-0.8	
Extreme Maximum Temperature[7] (°C)	26.0	23.5	28.3	32.2
Year/Day(s)[20]	1987/3	1986/17	1964/13	1943/5
Years of Record[21]	1	1	17	88
Extreme Minimum Temperature[7] (°C)	-6.5	-9.5	-18.3	-25.6
Year/Day(s)[20]	1987/24	1986/29, 31	1972/18	1919/26
Years of Record[21]	1	1	17	88
Days with Frost[8]	23	17	18	
Heating Degree-Days[9] (18°C base)	402.5	374.5	398.0	
Growing Degree-Days[10] (5°C base)	58.0	85.0	71.1	
Total Precipitation[11] (mm)	11.3	6.3	17.5	
Total Rainfall[11] (mm)	8.2	2.1	7.7	
Total Snowfall[12] (cm)	3.1	4.2	10.3	
Greatest 24-hour Precipitation (mm)	6.0	3.8	25.4	36.7
Year/Day(s)[20]	1987/3	1986/28	1969/2	1984/16
Years of Record[21]	1	1	17	88
Greatest 24-hour Rainfall (mm)	6.0	1.4	23.1	34.0
Year/Day(s)[20]	1987/3	1986/5	1969/2	1914/5
Years of Record[21]	1	1	17	88
Greatest 24-hour Snowfall (cm)	2.1	3.8	22.9	36.7
Year/Day(s)[20]	1987/18	1986/28	1969/3	1984/16
Years of Record[21]	1	1	17	88
Precipitation Days[13]	6	4	5	
Rainfall Days[13]	3	2	3	
Snowfall Days[13]	3	2	3	
Total Evaporation[14] (mm)	57.8*	58.0*	--	
Mean Wind Speed[15] (km/hr)	15.1**	12.4	18.0	
Peak Gust Speed[16] (km/hr)	67	58	138	
Total Bright Sunshine[17] (hr)	135.1	155.4	175.0	
Percent Possible Bright Sunshine[18]	41	47	53	
Total Global Radiation[19] (MJ m^{-2})	232.7	231.4	255.6	
Total Diffuse Radiation[19] (MJ m^{-2})	98.3	80.0	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	5.9, 9.1	6.3, 8.4	5.4, 8.0	
Mean Soil Temperature[22] (°C) (150, 300 cm)	10.0, 9.4	9.5, 9.2	9.8, 9.5	

*Evaporation program was discontinued after October 17, 1987 and October 27, 1986.
**26 days in 1987.

SUMMARY:

The October mean temperature (5.0°C) was close to the normal (5.2°C). Below normal temperatures were recorded on 16 of 31 days while normal and above normal temperatures were recorded on 16 days. Extreme maxima ranged between 26.0°C to 1.0°C while extreme minima ranged between 7.5°C to -6.5°C. The number of days with frost recorded (23) at the Climate Reference Station was greater than the normal by 5 days. The length of the frost free season was 137 days (May 21 to October 6, 1987 inclusive) making it the fourth longest growing season on record since 1900[a]. Total precipitation (11.3 mm) consisted of 8.2 mm of rain and 3.1 cm of snow. The first snowfall (2.1 cm) was recorded on the 18th, ten days earlier than 1986. The January to October total precipitation (219.8 mm) was only 67% of the normal (328.7 mm) for the same period. Bright sunshine hours (135.1 hrs) were considerably below the normal (175.0 hrs). Soil temperature at the 5 to 150 cm levels was above normal while mean soil temperature at the 300 cm level was slightly below the normal (by 0.1°C).

October has been a reasonably mild and dry month with slightly below normal temperatures and well below normal precipitation. While above normal temperatures were recorded during the first and last part of the month, below normal temperatures were dominant between the 6th to the 24th.

[a]data used for comparison: SRC - 1975-1986; Saskatoon A - 1900-1974.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
NOVEMBER, 1987

Table 12.

Element	1987 Value	1986 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	-0.3	-8.7	-5.5	
Monthly Mean Maximum Temperature[5] (°C)	5.3	-4.6	-1.0	
Monthly Mean Minimum Temperature[6] (°C)	-5.8	-12.8	-10.0	
Extreme Maximum Temperature[7] (°C)	14.0	9.5	19.4	21.7
Year/Day(s)[20]	1987/10	1986/4	1975/4	1903/3
Years of Record[21]	1	1	18	89
Extreme Minimum Temperature[7] (°C)	-14.0	-22.5	-32.8	-39.4
Year/Day(s)[20]	1987/17 & 19	1986/15 & 20	1970/27	1893/30
Years of Record[21]	1	1	18	89
Days with Frost[8]	26	29	29	
Heating Degree-Days[9] (18°C base)	554.0	804.5	704.4	
Growing Degree-Days[10] (5°C base)	5.0	0.5	2.6	
Total Precipitation[11] (mm)	1.6	15.9	16.0	
Total Rainfall[11] (mm)	1.4	3.1	2.5	
Total Snowfall[12] (cm)	0.2	12.8	12.3	
Greatest 24-hour Precipitation (mm)	0.8	7.3	19.3	27.9
Year/Day(s)[20]	1987/21	1986/18	1978/4	1938/1
Years of Record[21]	1	1	18	89
Greatest 24-hour Rainfall (mm)	0.8	2.4	14.5	14.5
Year/Day(s)[20]	1987/21	1986/2	1978/4	1978/4
Years of Record[21]	1	1	18	89
Greatest 24-hour Snowfall (cm)	0.2	7.3	13.2	27.9
Year/Day(s)[20]	1987/23	1986/18	1966/16	1938/1
Years of Record[21]	1	1	18	89
Precipitation Days[13]	3	8	9	
Rainfall Days[13]	3	3	1	
Snowfall Days[13]	1	5	8	
Total Evaporation[14] (mm)	--	--	--	
Mean Wind Speed[15] (km/hr)	11.0[a]	13.1	16.9	
Peak Gust Speed[16] (km/hr)	66.0	70.0	100.0	
Total Bright Sunshine[17] (hr)	110.5[b]	84.3	109.0	
Percent Possible Bright Sunshine[18]	42	32	41	
Total Global Radiation[19] (MJ m^{-2})	118.4	121.5	129.3	
Total Diffuse Radiation[19] (MJ m^{-2})	56.5	61.4	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	-0.6, 4.5	-1.2, 2.8	-1.7, 2.5	
Mean Soil Temperature[22] (°C) (150, 300 cm)	7.4, 8.3	6.7, 7.8	6.9, 8.1	

[a] 3 days of missing data.

[b] Includes 2 days of automatic data.

SUMMARY:

With the exception of the 19th, mean daily temperatures were above normal for the month. The mean temperature (-0.3°C) was 5.2°C above the normal (-5.5°C). November, 1987 becomes the sixth warmest on record since 1900. The warmest November was in 1917 with a monthly temperature of 2.6°C. Extreme temperatures ranged between 14.0°C to -14.0°C. Total precipitation (1.6 mm) recorded was only one tenth of the normal (16.0 mm), and consisted of 1.4 mm of rain and 0.2 mm of snow (water equivalent). The January-November total precipitation (221.4 mm) continues to be substantially below the normal (344.7 mm). Above normal temperatures were reflected in 21% fewer heating degree-days being recorded. Mean soil temperatures at all levels were above normal (by 0.2°C to 2.6°C).

November has been an exceptionally mild and dry month with above normal temperatures and below normal precipitation.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
DECEMBER, 1987

Table 13.

Element	1987 Value	1986 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	-7.7	-8.4	-13.9	
Monthly Mean Maximum Temperature[5] (°C)	-2.9	-3.3	-9.3	
Monthly Mean Minimum Temperature[6] (°C)	-12.4	-13.5	-18.5	
Extreme Maximum Temperature[7] (°C)	9.5	3.0	8.0	13.3
Year/Day(s)[20]	1987/7	1986/1, 23	1980/27	1939/5
Years of Record[21]	1	1	18	89
Extreme Minimum Temperature[7] (°C)	-25.0	-30.0	-42.2	-43.9
Year/Day(s)[20]	1937/30 & 31	1986/12	1973/31	1892/22
Years of Record[21]	1	1	18	89
Days with Frost[8]	30	31	31	
Heating Degree-Days[9] (18°C base)	797.0	821.5	992.0	
Growing Degree-Days[10] (5°C base)	0.0	0.0	0.0	
Total Precipitation[11] (mm)	11.0	2.8	25.8	
Total Rainfall[11] (mm)	1.7	0.0	0.8	
Total Snowfall[12] (cm)	9.3	2.8	23.1	
Greatest 24-hour Precipitation (mm)	3.4	1.4	14.5	20.6
Year/Day(s)[20]	1987/16	1986/1	1973/23	1936/24
Years of Record[21]	1	1	18	88
Greatest 24-hour Rainfall (mm)	1.6	0.0	4.3	4.8
Year/Day(s)[20]	1987/9	--	1979/6	1956/26
Years of Record[21]	1	1	18	89
Greatest 24-hour Snowfall (cm)	3.4	1.4	14.5	20.6
Year/Day(s)[20]	1987/16	1986/1	1973/23	1936/24
Years of Record[21]	1	1	18	88
Precipitation Days[13]	11	5	13	
Rainfall Days[13]	1	0	1	
Snowfall Days[13]	10	5	12	
Total Evaporation[14] (mm)	--	--	--	
Mean Wind Speed[15] (km/hr)	13.6**	12.9	16.8	
Peak Gust Speed[16] (km/hr)	54	67	97	
Total Bright Sunshine[17] (hr)	88.9	83.8	86.0	
Percent Possible Bright Sunshine[18]	37	35	36	
Total Global Radiation[19] (MJ m^{-2})	79.5*	92.9	96.0	
Total Diffuse Radiation[19] (MJ m^{-2})	43.0*	42.5	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	-3.9, 1.1	-3.9, -0.5	-6.6, -1.8	
Mean Soil Temperature[22] (°C) (150, 300 cm)	5.0, 7.6	4.0, 6.2	3.9, 6.2	

* 4 days missing data
** 2 days missing data

SUMMARY:

The mean temperature (-7.7°C) was above the normal (-13.9°C) by 6.1°C making December, 1987 the sixth warmest on record since 1901. Above normal temperatures were recorded on 26 of 31 days, while below normal temperatures were recorded on the remaining five days. The record maximum temperature for the 7th was surpassed when a temperature of 9.5°C was recorded. Temperatures ranged between a maximum of 9.5°C (on the 7th) to a minimum of -25.0°C (on the 30th and 31st). The monthly total precipitation (11.0 mm) was approximately 43% of the normal received, and consisted of 1.7 mm of rain and 9.3 mm of snow (water equivalent). The annual precipitation (232.4 mm) fell below the January to December normal precipitation (370.5 mm) by 138.1 mm. Soil temperatures at all levels remain above normal (by 1.1°C to 4.2°C). Twenty percent fewer than normal heating degree-days were recorded. Bright sunshine hours (88.9 hours) were slighly above the normal (86.0 hours).

As in the previous month, December has been a mild and dry month with above normal temperatures and below normal precipitation.

Table 14. Soil Temperature and Snow Cover at Saskatoon SRC, January 1987.

Depth (cm)	Mean Temp. (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	-5.3	7.5	31	1	7
10	-4.8	7.0	31	5	5
20	-3.4	5.0	31	10	5
50	-2.0	2.0	31	15	3
100	0.5	1.0	9	20	7
150	2.2	1.5	0	25	6
300	4.8	1.5	0	31	5

Table 15. Soil Temperature and Snow Cover at Saskatoon SRC, February 1987.

Depth (cm)	Mean Temp. (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	-3.8	3.5	28	1	5
10	-4.1	3.5	28	5	6
20	-2.4	2.5	28	10	5
50	-1.5	1.5	28	15	11
100	0.0	0.0	28	20	11
150	1.3	0.5	0	25	12
300	3.7	1.0	0	28	10

Table 16. Soil Temperature and Snow Cover at Saskatoon SRC, March 1987.

Depth (cm)	Mean Temp. (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	-1.6	7.0	31	1	10
10	-2.0	6.5	30	5	3
20	-0.5	5.0	18	10	0
50	-0.5	2.5	25	15	3
100	0.0	0.5	29	20	0
150	1.0	0.0	0	25	1
300	2.9	0.5	0	31	0

Table 17. Soil Temperature and Snow Cover at Saskatoon SRC, April 1987.

Depth (cm)	Mean Temp. (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	5.4	14.5	3	1	0
10	4.7	14.0	3	5	0
20	5.2	10.5	0	10	0
50	3.1	6.0	0	15	0
100	1.5	4.0	0	20	0
150	1.9	2.0	0	25	0
300	2.6	0.5	0	30	0

Table 18. Soil Temperature and Snow Cover at Saskatoon SRC, May 1987.

Depth (cm)	Mean Temp. (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	14.2	11.0	0	1	0
10	13.2	8.5	0	5	0
20	13.5	8.0	0	10	0
50	10.3	5.0	0	15	0
100	7.2	4.5	0	20	0
150	5.6	3.5	0	25	0
300	3.8	2.0	0	31	0

Table 19. Soil Temperature and Snow Cover at Saskatoon SRC, June 1987.

Depth (cm)	Mean Temp. (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	19.8	15.5	0	1	0
10	18.6	11.5	0	5	0
20	18.8	9.5	0	10	0
50	14.7	4.5	0	20	0
100	10.7	3.0	0	20	0
150	8.8	2.5	0	25	0
300	5.7	1.5	0	30	0

Table 20. Soil Temperature and Snow Cover at Saskatoon SRC, July 1987.

Depth (cm)	Mean Temp.[a] (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	20.4	16.0	0	1	0
10	19.2	13.0	0	5	0
20	19.7	8.0	0	10	0
50	16.2	3.0	0	15	0
100	12.5	1.5	0	20	0
150	10.8	1.5	0	25	0
300	7.6	1.5	0	31	0

[a] - one day of missing data

Table 21. Soil Temperature and Snow Cover at Saskatoon SRC, August 1987.

Depth (cm)	Mean Temp. (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	17.1	14.0	0	1	0
10	16.2	11.0	0	5	0
20	17.3	9.0	0	10	0
50	15.8	4.0	0	15	0
100	13.1	1.5	0	20	0
150	11.8	0.5	0	25	0
300	9.0	1.0	0	31	0

Table 22. Soil Temperature and Snow Cover at Saskatoon SRC, September 1987.

Depth (cm)	Mean Temp.[a] (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	14.9	15.0	0	1	0
10	13.7	11.0	0	5	0
20	15.2	7.5	0	10	0
50	14.1	2.5	0	15	0
100	12.1	1.0	0	20	0
150	11.4	0.5	0	25	0
300	9.5	0.0	0	30	0

[a] - one day of missing data

Table 23. Soil Temperature and Snow Cover at Saskatoon SRC, October 1987.

Depth (cm)	Mean Temp. (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	5.9	16.5	1	1	0
10	5.3	13.5	0	5	0
20	7.6	11.5	0	10	0
50	9.1	7.0	0	15	0
100	9.6	4.0	0	20	0
150	10.0	2.5	0	25	0
300	9.4	1.0	0	31	0

Table 24. Soil Temperature and Snow Cover at Saskatoon SRC, November 1987.

Depth (cm)	Mean Temp. (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	-0.1	-11.5	18	1	0
10	-0.6	9.0	18	5	0
20	1.9	8.0	10	10	0
50	4.5	5.0	0	15	0
100	6.1	2.5	0	20	0
150	7.4	2.5	0	25	0
300	8.3	1.0	0	30	0

Table 25. Soil Temperature and Snow Cover at Saskatoon SRC, December 1987.

Depth (cm)	Mean Temp. (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	-3.6	8.5	31	1	0
10	-3.9	8.5	31	5	0
20	-1.5	5.5	30	10	0
50	1.1	2.5	5	15	1
100	3.3	2.5	0	20	4
150	5.0	2.0	0	25	4
300	7.6	1.5	0	31	4

Table 26. Diffuse Solar Radiation (MJ m^{-2}) at Saskatoon SRC, 1987.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.9	2.8	3.1	5.5	7.0	7.5	9.7	2.8	8.3	2.8	3.4	0.8
2	2.2	3.0	4.4	2.3	4.8	9.3	3.4	7.7	4.1	1.7	1.5	M
3	1.6	2.7	5.5	3.3	6.7	7.6	5.3	7.9	5.3	4.0	2.1	M
4	1.3	2.4	4.5	2.3	5.6	6.5	7.6	7.4	4.5	5.2	1.4	M
5	1.6	2.9	4.7	2.5	4.6	10.7*	M	5.1	3.2	4.0	2.4	1.2
6	1.6	2.9	3.6	2.4	4.3	5.2	6.8e	4.5	6.6	4.2	2.8	1.5
7	1.2	M	4.9	2.5	4.7	9.5	8.2	5.1	2.4	4.0	3.1	1.4
8	1.1	2.6	1.9	6.5	4.6	7.9	5.8	7.7	7.6	3.3	2.3	1.1
9	1.2	2.7	5.1	2.2	8.8	9.7	4.0	7.1	2.9	4.0	3.5	0.8
10	2.1	1.6	5.3	7.0	9.6	8.3	10.9*	7.5	6.8	2.0	1.4	0.7
11	1.5	2.1	4.3	7.2	5.4	4.9	9.3	7.0	12.9*	4.4	2.7	1.6
12	2.0	2.7	2.7	4.8	6.7	10.6*	5.3	5.7	2.4	2.2	2.5	1.4
13	1.7	3.7	4.7	3.0	7.1	3.0	7.7	5.2	4.0	2.0	3.0	1.6
14	1.5	2.9	5.5	8.3	6.8	4.6	3.5	8.0	5.3	3.7	2.0	1.8
15	1.0	4.9	5.4	4.8	4.3	10.3*	8.7	7.9	5.4	1.6	1.2	1.2
16	1.2	5.2	6.6	9.3	9.6	9.3	7.5	8.3	5.3	3.7	1.6	1.8
17	1.7	4.5	5.2	6.4	4.6	4.8	6.9	7.4	M	4.2	1.7	1.5
18	2.4	1.6	4.0	3.5	5.2	3.7	5.9	5.9	3.0	2.3	2.0	3.4
19	2.4	3.7	6.8	4.9	9.2	9.4	7.0	6.1	2.3	5.1	1.4	2.1
20	1.9	2.5	6.6	4.4	9.0	7.5	8.7	4.6	4.4	3.8	1.4	1.6

Note: M means missing values
e means estimated value

Table 26. (Continued)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
21	4.9	4.9	4.7	3.7	6.8	5.2	M	4.4	3.1	3.1	1.7	M
22	2.8	5.4	1.9	4.4	11.6*	10.1*	M	3.3	2.0	3.0	0.9	1.7
23	3.1	5.9	4.4	7.7	6.6	7.7	M	3.6	2.7	3.9	1.7	2.0
24	2.9	3.0	8.3	4.0	4.9	9.8	M	9.2*	1.7	1.6	0.8	1.9
25	3.1	6.1	11.2	5.5	9.7*	4.2	4.7	9.1*	2.3	2.4	2.2	1.7
26	1.9	3.0	8.4*	5.7	6.8	5.4	6.8	4.8	3.6	1.4	1.7	2.2
27	2.2	3.2	16.4*	M	5.5	8.2	6.9	5.1	4.7	3.9	1.6	0.9
28	2.0	3.2	17.9*	M	6.6	9.4	4.0	9.1*	2.8	3.2	1.4	0.9
29	2.3		13.9*	8.5	6.7	8.6	7.5	5.9	3.0	2.3	1.1	2.0
30	1.7		7.2	4.1	8.2	7.6	M	3.5	5.1	2.3	1.0	2.2
31	1.9		2.4		7.8		M	4.3		3.0		2.0
Total Diffuse	60.9	92.1	191.5	136.7	209.9	226.5	162.1	191.2	114.8	98.3	56.5	43.0
Total Global	127.6	199.1	307.1	428.0	584.0	614.0	426.0	481.7	386.7	232.7	118.4	79.5

Note: M means missing values.
* means these values are questionably high (shade ring problem)
e means estimated value

Table 27. Some Significant Climatic Events, 1987.

FROST FREE SEASON

	Last Spring Frost	First Fall Frost	Length of Season
1987	May 21	October 6	137
1986	May 17	September 6	111

SNOW SEASON

Greatest Depth of Snow on Ground (cm)

	Jan.	Feb.	Mar.	Apr.	Oct.	Nov.	Dec.
1987	8	13	10	0	0	0	7
1986	13	10	6	0	3	6	7

	Cessation[1] of Snow Pack	Last Spring Snowfall	First Fall Snow	Onset[2] of Snow Pack
1987	March 26	April 9	October 18	December 11
1986	March 1	April 2	October 28	November 14

WEATHER "SPELLS"[3,4]

	1987	1986
Longest Cool Spell:	19 days, Aug. 8-26	17 days, Feb. 7-23
Longest Warm Spell:	40 days, Jan. 15-Feb. 23	31 days, Jan. 7- Feb 6
Longest Dry Spell:	22 days, Sept. 11-Oct. 2	20 days, Aug. 10-29 and Oct. 8-27
Longest Wet Spell:	5 days, May 24-28	9 days, July 9-17

[1]First day on the first interval of at least 5 days duration in which snow cover is reduced to less than 1 cm depth.

[2]First day on the first interval of at least 5 days duration in which snow cover equals or exceeds 1 cm depth.

[3]Temperature "spells" are defined as a sequence of days when the daily mean temperature during the year in question is higher (warm spell) or lower (cold spell) than the long-term daily mean for the date in question.

[4]Precipitation "spells" are defined as the sequence of days with precipitation amounts greater than trace (wet spells) or precipitation amounts of trace or less (dry spells).

Table 28: Times of Sunrise at Saskatoon, 1987.

DATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	9.16	8.48	7.55	6.43	5.38	4.52	4.50	5.26	6.17	7.06	8.00	8.51
2	9.15	8.47	7.52	6.41	5.36	4.52	4.50	5.28	6.18	7.08	8.02	8.53
3	9.15	8.45	7.50	6.39	5.34	4.51	4.51	5.30	6.20	7.09	8.04	8.54
4	9.15	8.44	7.48	6.36	5.32	4.50	4.52	5.31	6.22	7.11	8.06	8.56
5	9.15	8.42	7.46	6.34	5.30	4.49	4.53	5.33	6.23	7.13	8.07	8.57
6	9.14	8.40	7.43	6.32	5.29	4.49	4.53	5.34	6.25	7.14	8.09	8.58
7	9.14	8.38	7.41	6.30	5.27	4.48	4.54	5.36	6.26	7.16	8.11	9.00
8	9.14	8.37	7.39	6.27	5.25	4.48	4.55	5.37	6.28	7.18	8.13	9.01
9	9.13	8.35	7.37	6.25	5.23	4.47	4.56	5.39	6.30	7.20	8.15	9.02
10	9.13	8.33	7.34	6.23	5.22	4.47	4.57	5.41	6.31	7.21	8.16	9.03
11	9.12	8.31	7.32	6.20	5.20	4.46	4.58	5.42	6.33	7.23	8.18	9.04
12	9.11	8.29	7.30	6.18	5.18	4.46	4.59	5.44	6.35	7.25	8.20	9.05
13	9.11	8.28	7.27	6.16	5.16	4.46	5.00	5.46	6.36	7.26	8.22	9.06
14	9.10	8.26	7.25	6.14	5.15	4.45	5.02	5.47	6.38	7.28	8.24	9.07
15	9.09	8.24	7.23	6.11	5.13	4.45	5.03	5.49	6.40	7.30	8.25	9.08
16	9.08	8.22	7.21	6.09	5.12	4.45	5.04	5.50	6.41	7.32	8.27	9.09
17	9.07	8.20	7.18	6.07	5.10	4.45	5.05	5.52	6.43	7.33	8.29	9.10
18	9.06	8.18	7.16	6.05	5.09	4.45	5.06	5.54	6.44	7.35	8.31	9.11
19	9.05	8.16	7.14	6.03	5.07	4.45	5.08	5.55	6.46	7.37	8.32	9.11
20	9.04	8.14	7.11	6.01	5.06	4.45	5.09	5.57	6.48	7.39	8.34	9.12
21	9.03	8.12	7.09	5.58	5.05	4.45	5.10	5.59	6.49	7.40	8.36	9.13
22	9.02	8.10	7.07	5.56	5.03	4.46	5.12	6.00	6.51	7.42	8.37	9.13
23	9.01	8.07	7.04	5.54	5.02	4.46	5.13	6.02	6.53	7.44	8.39	9.14
24	9.00	8.05	7.02	5.52	5.01	4.46	5.15	6.03	6.54	7.46	8.41	9.14
25	8.58	8.03	7.00	5.50	5.00	4.46	5.16	6.05	6.56	7.48	8.42	9.14
26	8.57	8.01	6.57	5.48	4.58	4.47	5.17	6.07	6.58	7.49	8.44	9.15
27	8.56	7.59	6.55	5.46	4.57	4.47	5.19	6.08	6.59	7.51	8.45	9.15
28	8.54	7.57	6.53	5.44	4.56	4.48	5.20	6.10	7.01	7.53	8.47	9.15
29	8.53	0.00	6.50	5.42	4.55	4.48	5.22	6.12	7.03	7.55	8.49	9.15
30	8.51	0.00	6.48	5.40	4.54	4.49	5.23	6.13	7.04	7.57	8.50	9.16
31	8.50	0.00	6.46	0.00	4.53	0.00	5.25	6.15	0.00	7.58	0.00	9.16

Note: Local standard time is given in hours and minutes according to the 24 hr. notation.

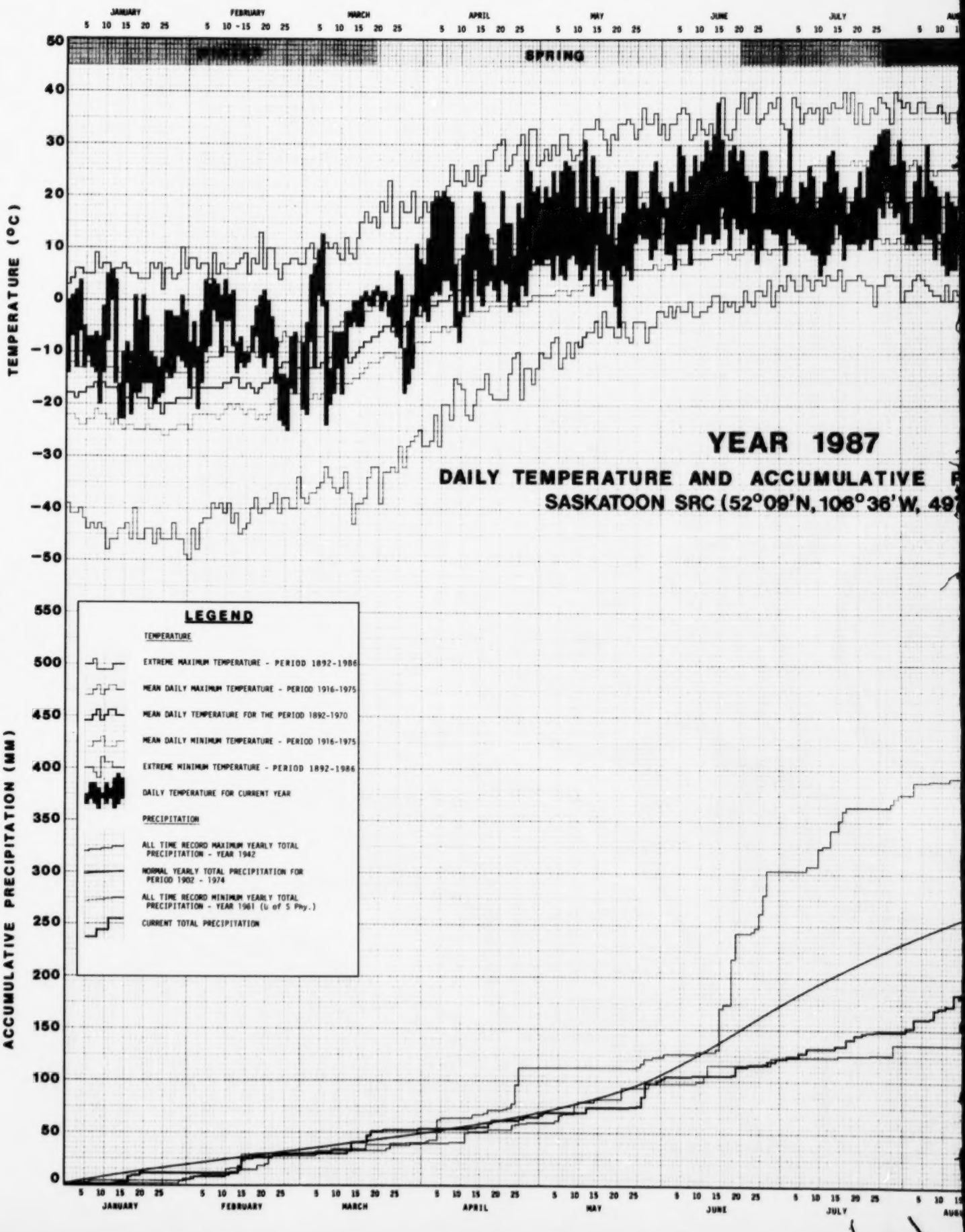
Table 29: Times of Sunset at Saskatoon, 1987

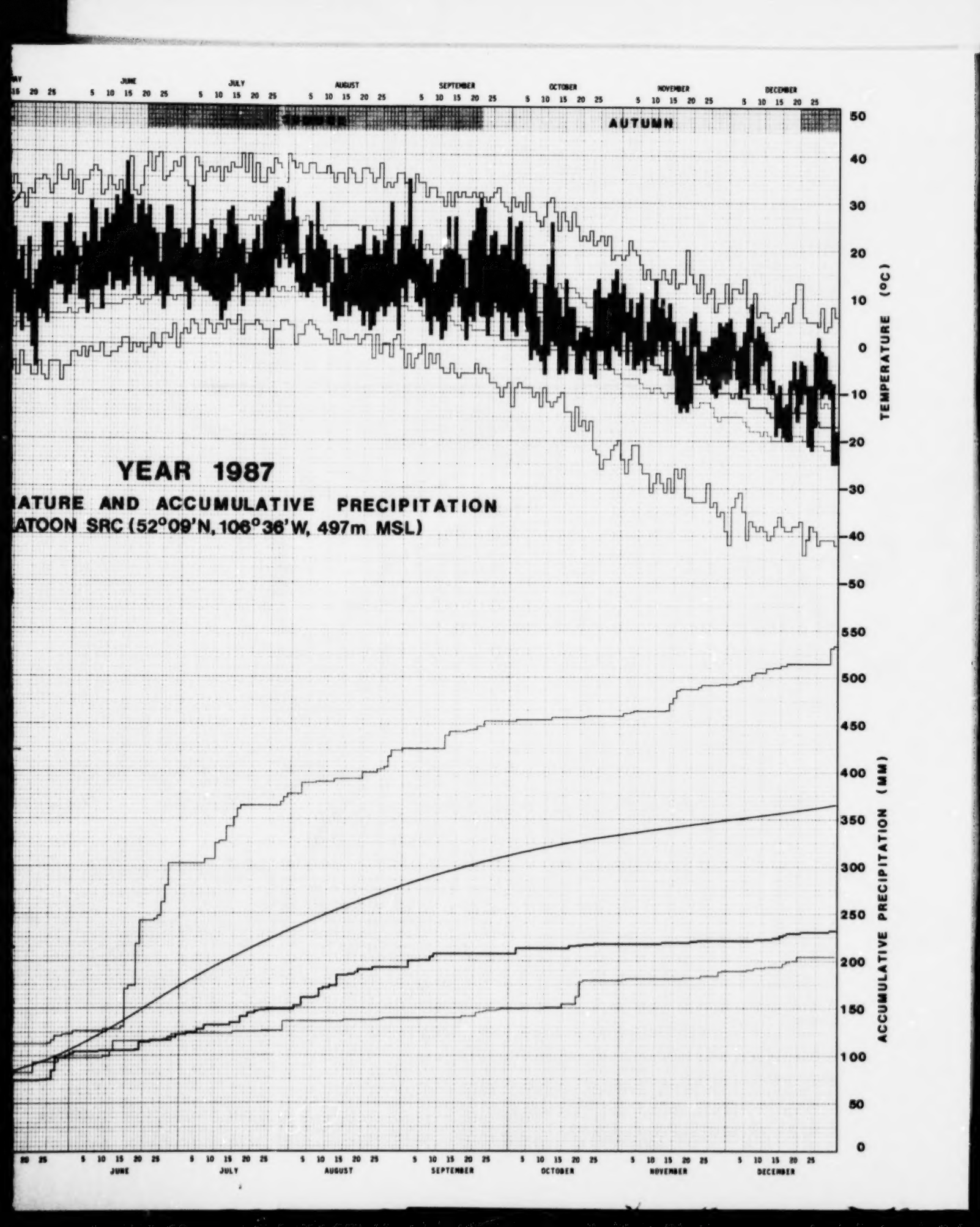
DATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	17.04	17.52	18.44	19.38	20.29	21.16	21.31	20.59	19.57	18.47	17.40	16.59
2	17.05	17.54	18.45	19.40	20.31	21.17	21.31	20.58	19.55	18.45	17.38	16.58
3	17.06	17.55	18.47	19.42	20.33	21.18	21.30	20.56	19.53	18.42	17.36	16.58
4	17.07	17.57	18.49	19.43	20.35	21.19	21.30	20.54	19.50	18.40	17.35	16.57
5	17.08	17.59	18.51	19.45	20.36	21.20	21.29	20.53	19.48	18.38	17.33	16.56
6	17.10	18.01	18.53	19.47	20.38	21.21	21.29	20.51	19.46	18.36	17.31	16.56
7	17.11	18.03	18.54	19.48	20.40	21.22	21.28	20.49	19.43	18.33	17.29	16.56
8	17.12	18.05	18.56	19.50	20.41	21.23	21.28	20.47	19.41	18.31	17.28	16.55
9	17.13	18.07	18.58	19.52	20.43	21.24	21.27	20.45	19.39	18.29	17.26	16.55
10	17.15	18.08	19.00	19.54	20.44	21.25	21.26	20.43	19.36	18.26	17.24	16.55
11	17.16	18.10	19.02	19.55	20.46	21.26	21.26	20.41	19.34	18.24	17.23	16.54
12	17.18	18.12	19.03	19.57	20.48	21.26	21.25	20.40	19.32	18.22	17.21	16.54
13	17.19	18.14	19.05	19.59	20.49	21.27	21.24	20.38	19.29	18.20	17.20	16.54
14	17.21	18.16	19.07	20.00	20.51	21.28	21.23	20.36	19.27	18.17	17.18	16.54
15	17.22	18.18	19.09	20.02	20.52	21.28	21.22	20.34	19.25	18.15	17.17	16.54
16	17.24	18.20	19.10	20.04	20.54	21.29	21.21	20.32	19.22	18.13	17.15	16.54
17	17.25	18.22	19.12	20.06	20.56	21.29	21.20	20.30	19.20	18.11	17.14	16.54
18	17.27	18.23	19.14	20.07	20.57	21.30	21.19	20.28	19.18	18.09	17.12	16.55
19	17.29	18.25	19.16	20.09	20.59	21.30	21.18	20.25	19.15	18.07	17.11	16.55
20	17.30	18.27	19.17	20.11	21.00	21.31	21.17	20.23	19.13	18.04	17.10	16.55
21	17.32	18.29	19.19	20.12	21.01	21.31	21.15	20.21	19.11	18.02	17.09	16.56
22	17.34	18.31	19.21	20.14	21.03	21.31	21.14	20.19	19.08	18.00	17.07	16.56
23	17.35	18.33	19.23	20.16	21.04	21.31	21.13	20.17	19.06	17.58	17.06	16.57
24	17.37	18.35	19.24	20.18	21.06	21.31	21.11	20.15	19.03	17.56	17.05	16.57
25	17.39	18.36	19.26	20.19	21.07	21.31	21.10	20.13	19.01	17.54	17.04	16.58
26	17.41	18.38	19.28	20.21	21.08	21.31	21.09	20.10	18.59	17.52	17.03	16.58
27	17.43	18.40	19.30	20.23	21.10	21.31	21.07	20.08	18.56	17.50	17.02	16.59
28	17.44	18.42	19.31	20.24	21.11	21.31	21.06	20.06	18.54	17.48	17.01	17.00
29	17.46	0.00	19.33	20.26	21.12	21.31	21.04	20.04	18.52	17.46	17.01	17.01
30	17.48	0.00	19.35	20.28	21.14	21.31	21.03	20.02	18.49	17.44	17.00	17.02
31	17.50	0.00	19.36	0.00	21.15	0.00	21.01	19.59	0.00	17.42	0.00	17.03

Note: Local Standard Time is given in hours and minutes according to the 24 hr. notation.

Figure 1. Year 1987 Daily Temperature and Cumulative Precipitation

In order to present the maximum length of climatic record for the Saskatoon area, data from several sources have been pooled to produce the historic record shown in this figure. For data sources please refer to Footnotes for Climatic Tables, note 3. The seasons shown are defined on an astronomical basis.


JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
SPRING
TEMPERATURE (°C)
ACCUMULATIVE PRECIPITATION (MM)
YEAR 1987
DAILY TEMPERATURE AND ACCUMULATIVE
SASKATOON SRC (52°09'N, 106°36'W, 49
LEGEND
TEMPERATURE
EXTREME MAXIMUM TEMPERATURE - PERIOD 1892-1986
MEAN DAILY MAXIMUM TEMPERATURE - PERIOD 1916-1975
MEAN DAILY TEMPERATURE FOR THE PERIOD 1892-1970
MEAN DAILY MINIMUM TEMPERATURE - PERIOD 1916-1975
EXTREME MINIMUM TEMPERATURE - PERIOD 1892-1986
DAILY TEMPERATURE FOR CURRENT YEAR
PRECIPITATION
ALL TIME RECORD MAXIMUM YEARLY TOTAL PRECIPITATION - YEAR 1942
NORMAL YEARLY TOTAL PRECIPITATION FOR PERIOD 1902 - 1974
ALL TIME RECORD MINIMUM YEARLY TOTAL PRECIPITATION - YEAR 1961 (U of S Phy.)
CURRENT TOTAL PRECIPITATION


JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
AUTUMN
TEMPERATURE (°C)
ACCUMULATIVE PRECIPITATION (MM)
YEAR 1987
ATURE AND ACCUMULATIVE PRECIPITATION
ATOON SRC (52°09'N, 106°36'W, 497m MSL)